7.023MHz 7.030MHz 7.050MHz
40 meter band CW QRP

S-RockMite QRP Kit

User Manual

Revision V171206

Welcome to visit the home page www.lxqqfy.com to obtain the latest data.

1. Introduction

This is a very small volume of simple 40 meter band micro-power amplitude telegraph transceiver, Despite it's small size and DC receiver limitations, it is capable of working several hundred miles when connected to a good 40 meter antenna.

There are many versions of "**RockMite**", "**RockMite SWL**", "**RockMite PIC**", "**RockMite 51**", and "**S-RockMite**". "**S-RockMite**" is so far the latest version. "**RockMite 51**" and "**S-RockMite**" is designed by "**LXQQFY.com**". The new product adds the following new features.

- The vertical resistance changed to horizontal resistance.
- It do not distinguish between positive and negative input power.
- Provide acrylic case.
- Provide WIFI module options. Support automatic key and automatic transmitter.
- Can connect the phone to change the configuration.

2. Specifications

Power supply: 9~13.8 Volts DC, >1A (Recommend the use of batteries)
Antenna: 50ohm, 7MHz, SWR<2.0
Receive: static current 60mA
Transmission power: 5W
Frequency: launch the vibration frequency,7023 KHz
Receives the local oscillator frequency: about 7023-7023 KHz
Work mode: CW
KEY: Manual and automatic auto-detection
Automatic sending: ok
Config: the mobile phone application(WIFI)
Case: acrylic

3. Circuit principle

Reference schematic diagram. Receiving part is the core of a NE602, inside it includes an oscillating circuit and a balanced mixer, antenna in the signal after 2 crystal filter, into the mixer, The basic oscillation signal is sent out by the 9018 oscillation circuit, two signals through mixing, directly put the CW signal frequency conversion for audio, NE602 output audio and then sent to the NE5532 to do the active low-pass filter and audio amplification, so that the whole process of the reception. it is called "DC receiver". 2N7000 field effect tube is used for closing reception at launch. At the same time, the WIFI module generates the side sound, which is output to the earphone. The launch part uses 9018 to do the oscillation circuit, then the 8050 makes the buffer enlargement. 8050 is also used as a launch key control, control transceiver circuit and signal switching. The last stage is composed of a D882 class C amplifier, matched by 1:4 transformer, after LPF filter is connected with the antenna.

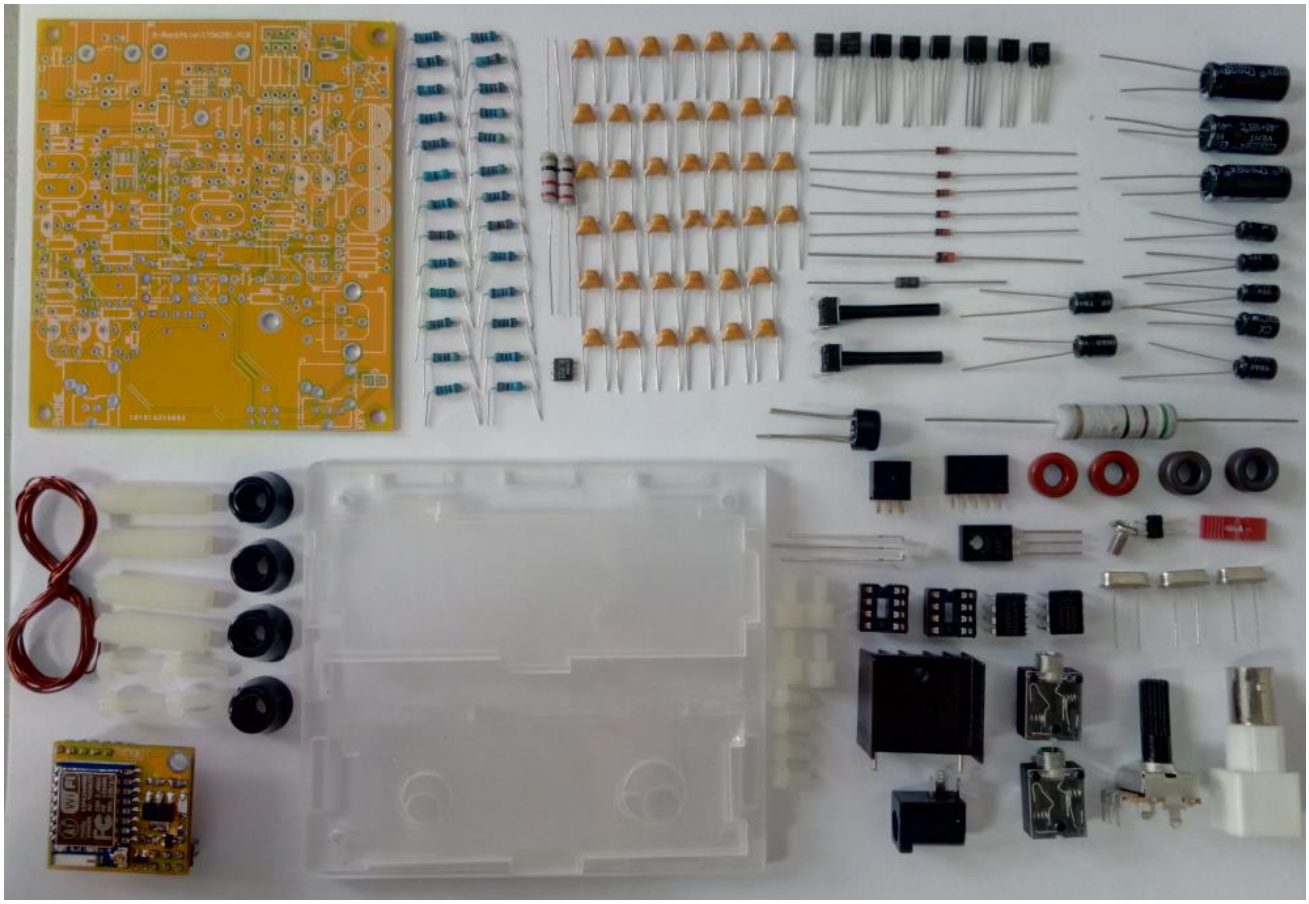
The WIFI module is optional. If you do not use the WIFI module, you need to short circuit the JP1, then "S-RockMite" == "RockMite" == Ordinary CW radio. If you use the WIFI module, you need to unplug the JP1,then you can use the mobile phone configuration data.

4. Component selection

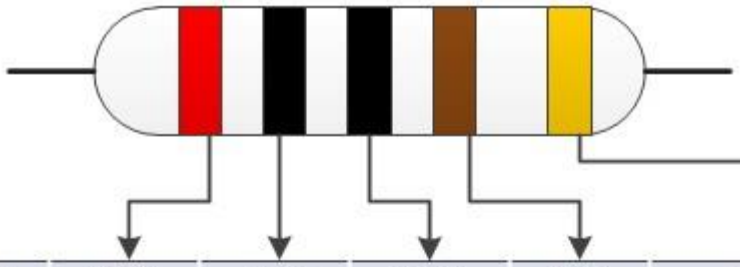
9018 magnification is about 130 , D882 magnification is about 200. T1 is 1:4 transmission line transformer, in FT37-43 iron and oxygen magnet ring bodies (black) using 0.51 mm paint envelope double hinge line in and around six times, then connecting a coil with a head and a tail. T2 is the high frequency transformer, in FT37-43 iron and oxygen magnet ring bodies (black) using 0.51 mm paint covered wire for winding, Primary 8 turn, secondary 2 turn. L1 L2 is the high frequency filter inductance in T37-2 on the iron core is circular and(red) using 16 to 0.5 mm enameled wire around.

5. Production process

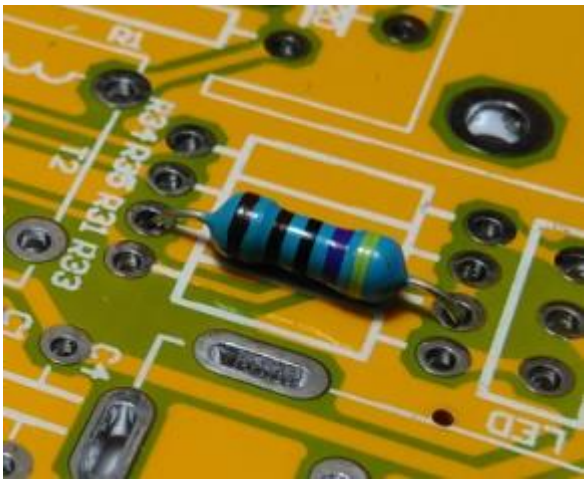
5.1 According to the list of components, check the number of components. Have tools, Electric iron, Solder wire, and A multimeter on hand. Take welding from low to high order, Recommend: Resistance -> Diode -> Capacitance -> Triode -> Crystal oscillator -> LED -> Bridge rectifier -> Electrolytic capacitor -> Ic -> Inductor -> Magnet ring -> D882 -> Other.

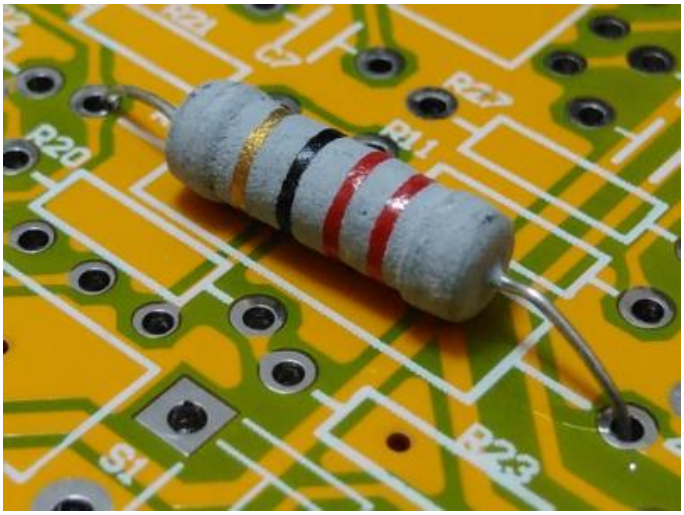


5.2 Resistance.

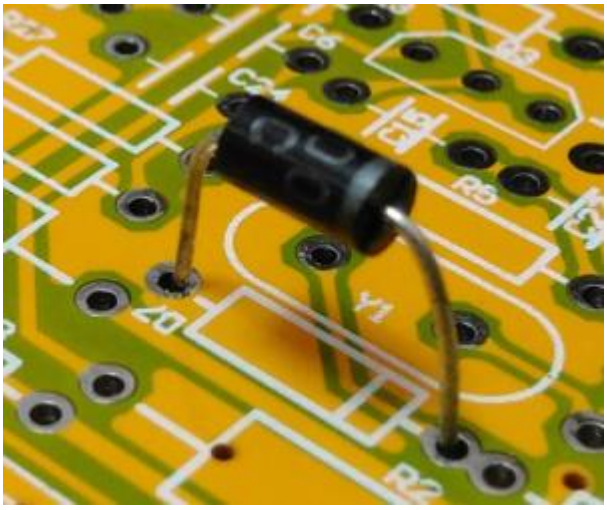


颜色	百位	十位	个位	倍数	精度
黑	0	0	0	1	
棕	1	1	1	10^1	±1%
红	2	2	2	10^2	±2%
橙	3	3	3	10^3	
黄	4	4	4	10^4	
绿	5	5	5	10^5	±0.5%
蓝	6	6	6	10^6	±0.25%
紫	7	7	7	10^7	±0.1%
灰	8	8	8	10^8	±0.05%
白	9	9	9	10^9	±50%
金				10^{-1}	±5%
银				10^{-2}	±10%
透明					±20%

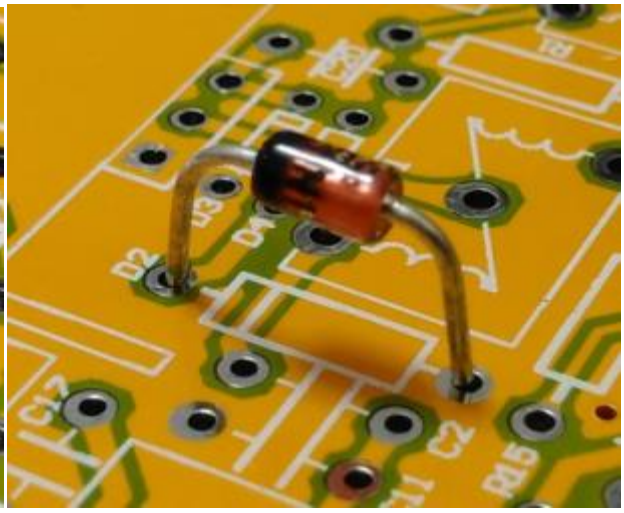




5.3 Diode.



1N4001



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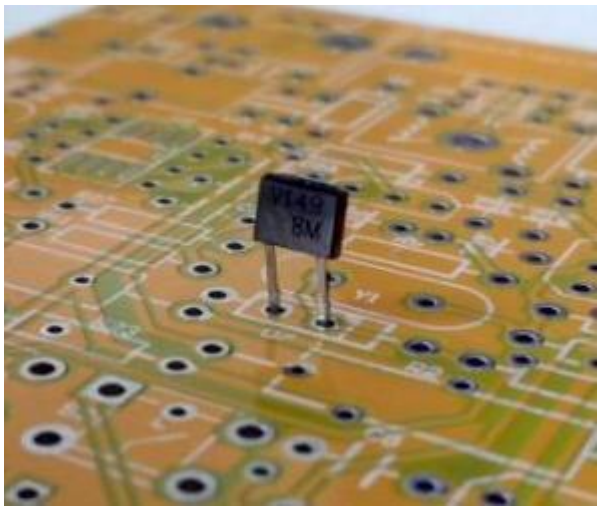
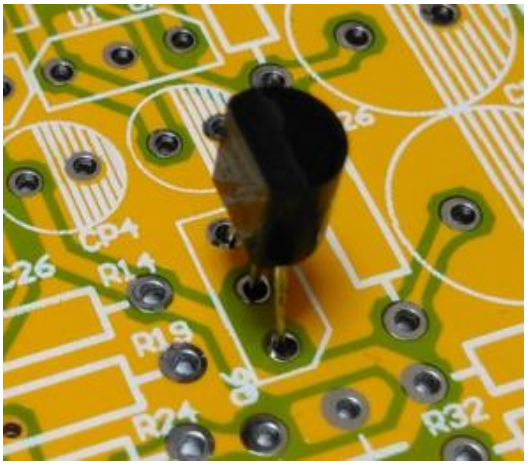


Variode

5.4 Capacitance.

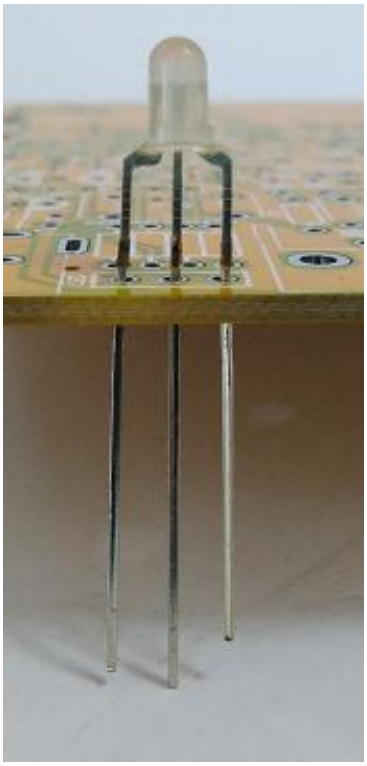
0.1uF(104) 10nF(103) 1nF(102) 100pF(101) 33pF(33) 56pF(56) 470pF(471)

5.5 Triode and FET.

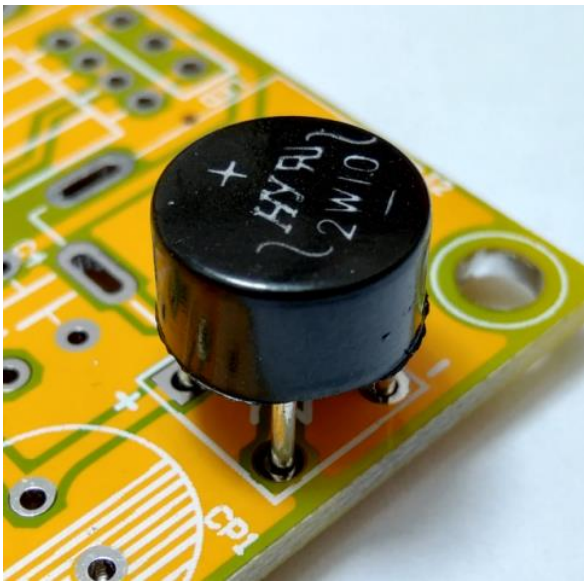


5.6 Crystal oscillator.

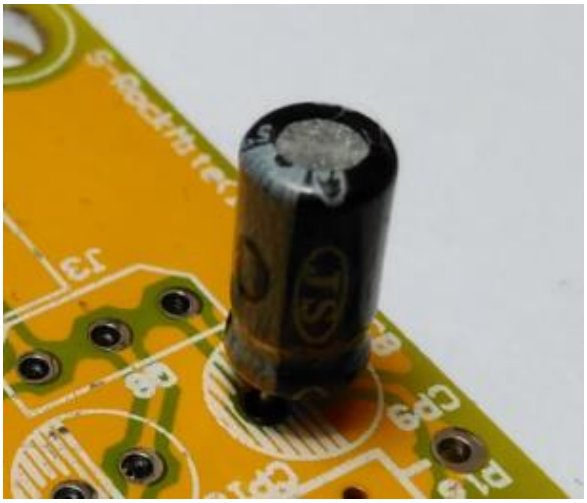
5.7 LED.



5.8 Bridge rectifier.

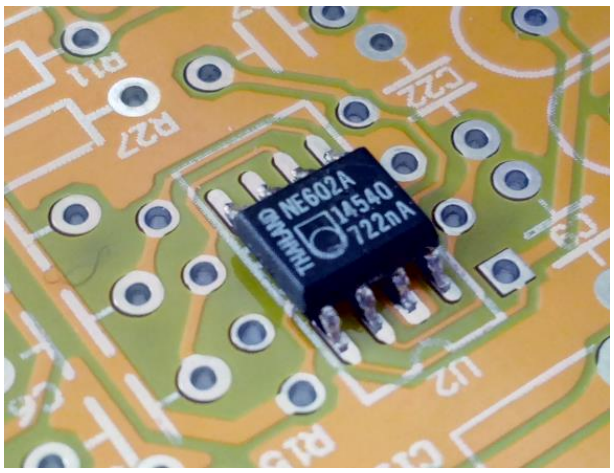


5.9 Electrolytic capacitor.



5.10 Ic.

A. Default



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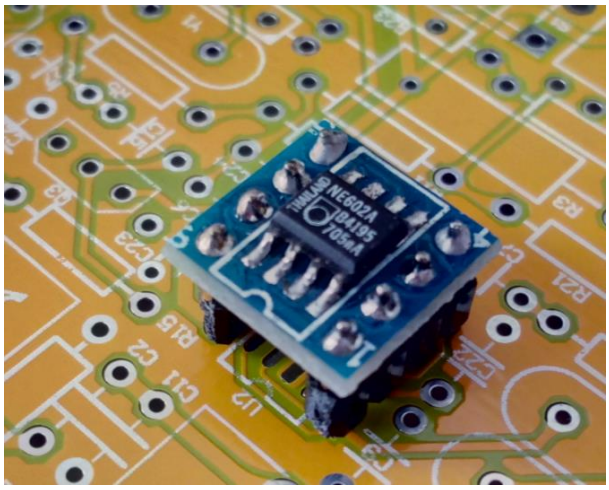
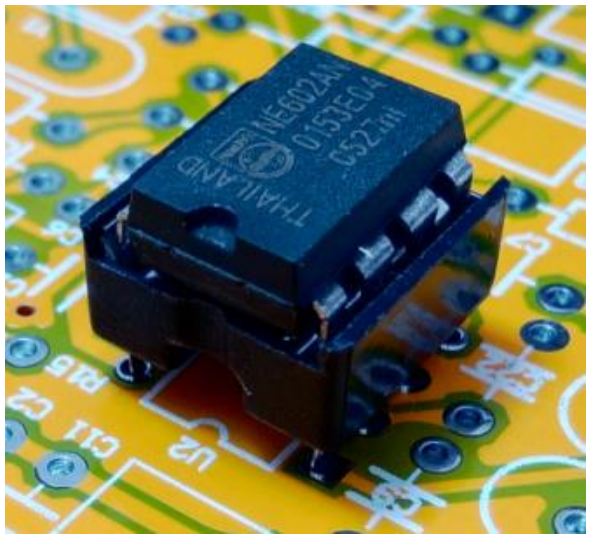
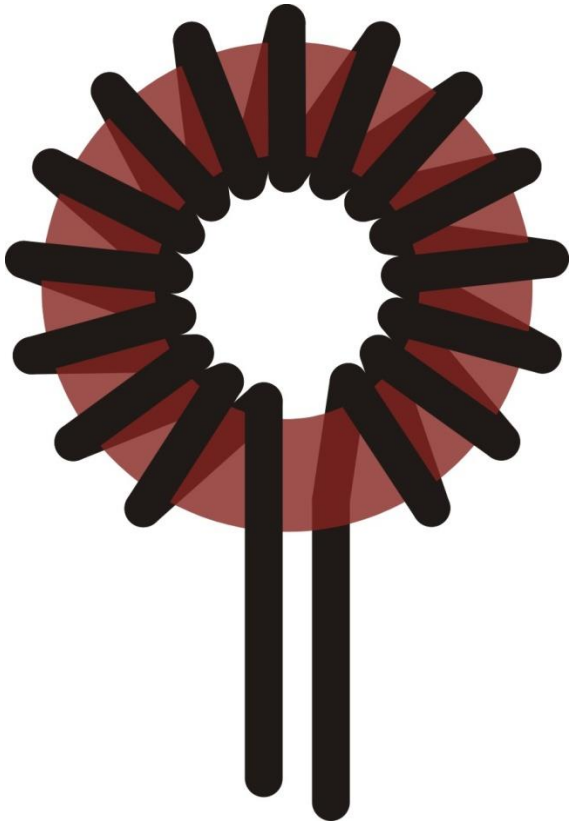


C.

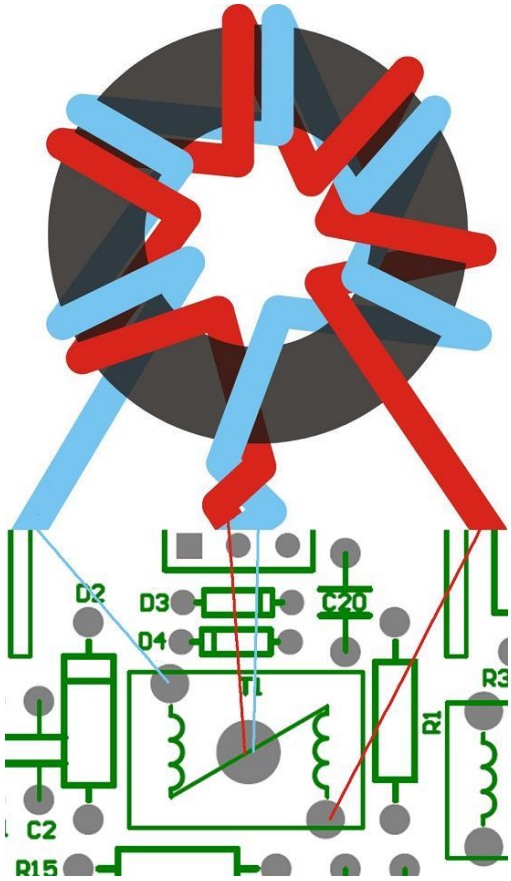


5.11 Inductance.

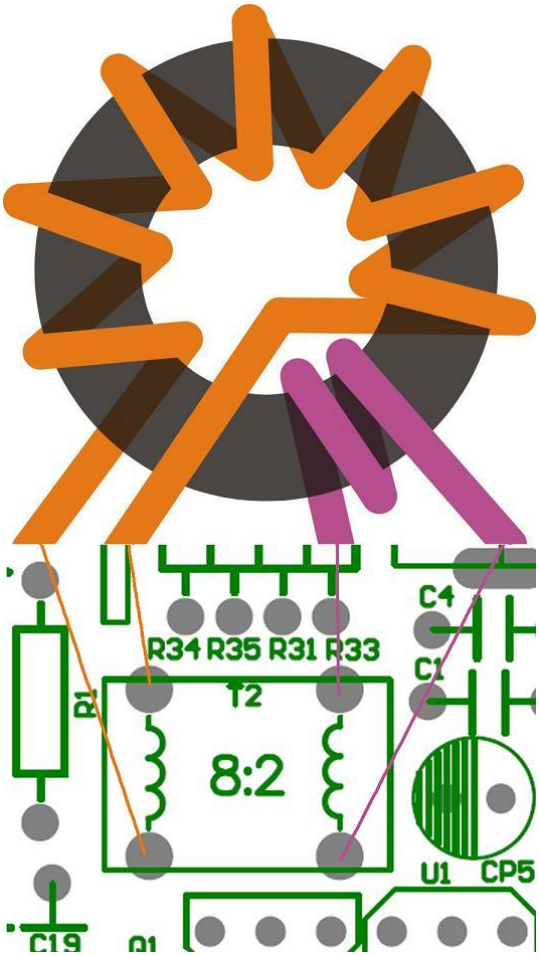
5.11.1 L1 L2, 1uH(T37-2 16 turns)

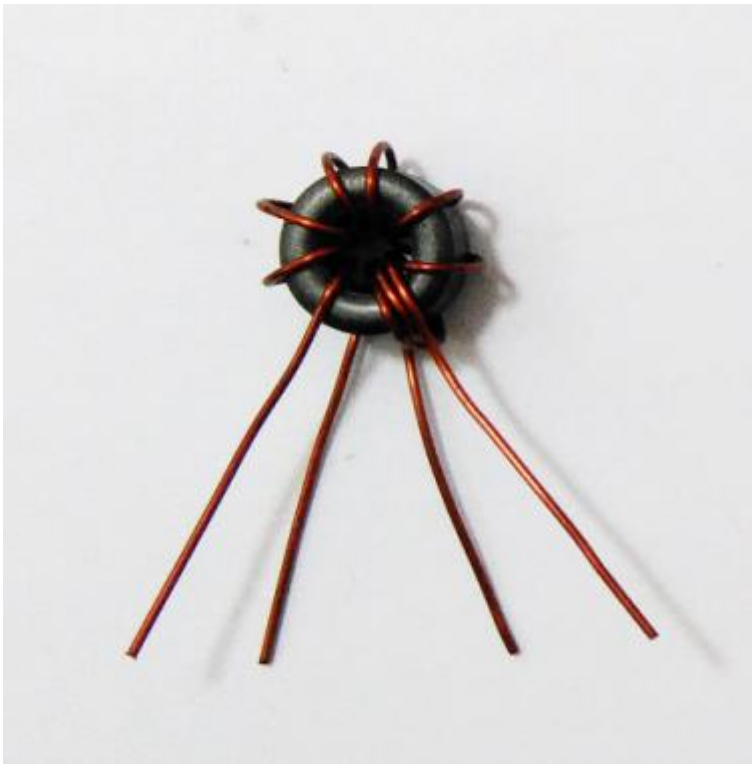


5.11.2 T1, 1:4 transformer (FT37-43 6 turns)

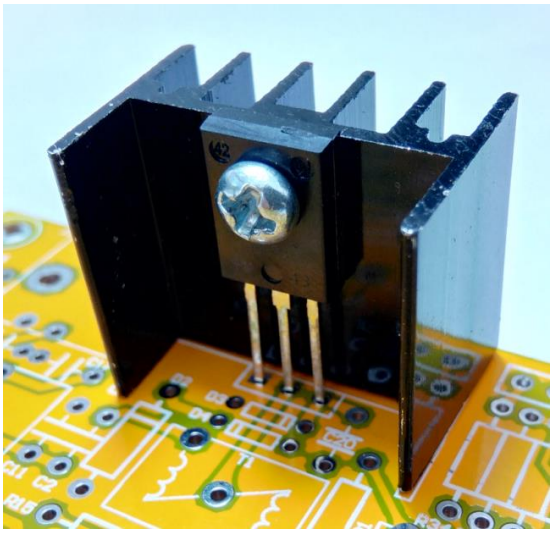


5.11.3 T2, Transformer(FT37-43 8 turns : 2 turns)

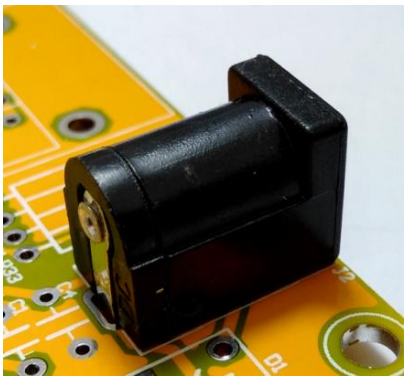




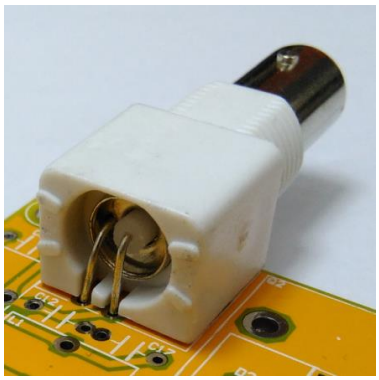
5.12 D882.



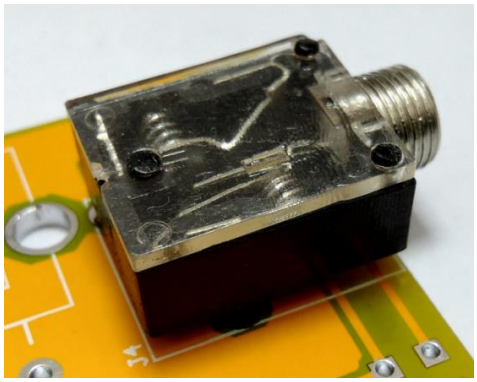
5.13 Other.



DC Jack

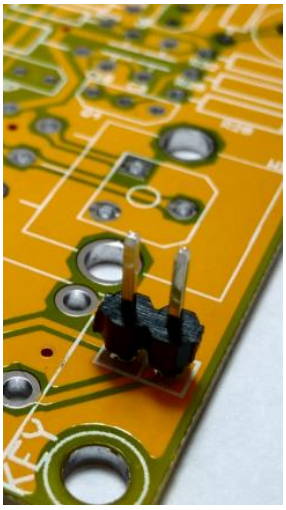


Q9(BNC)

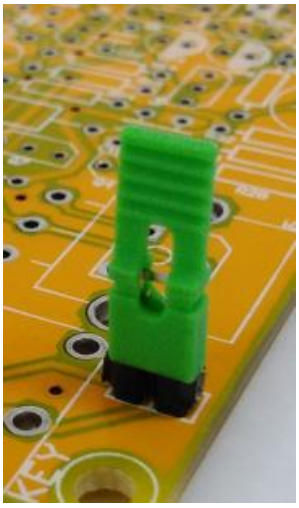


3.5mm Socket(Key and Phone)

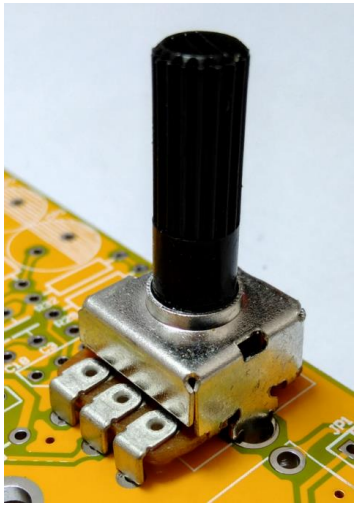
Key



Pin

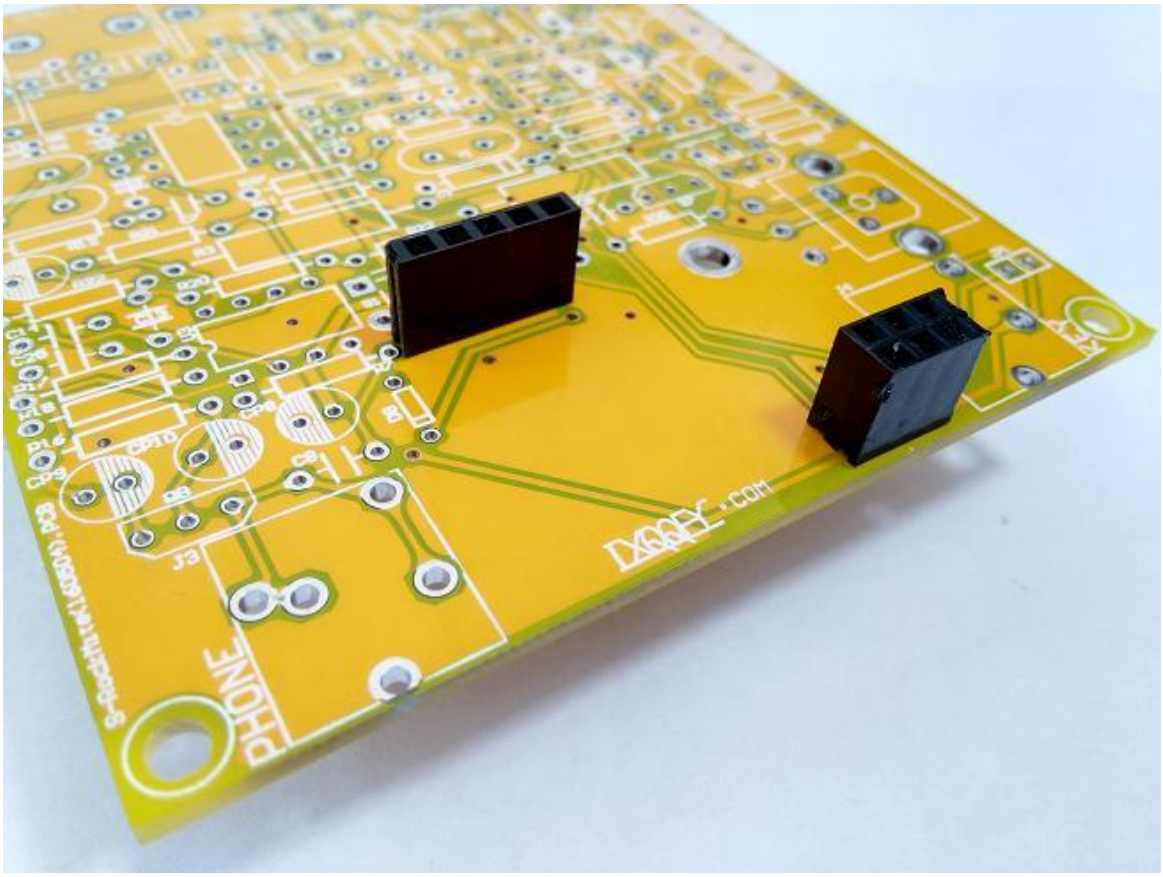


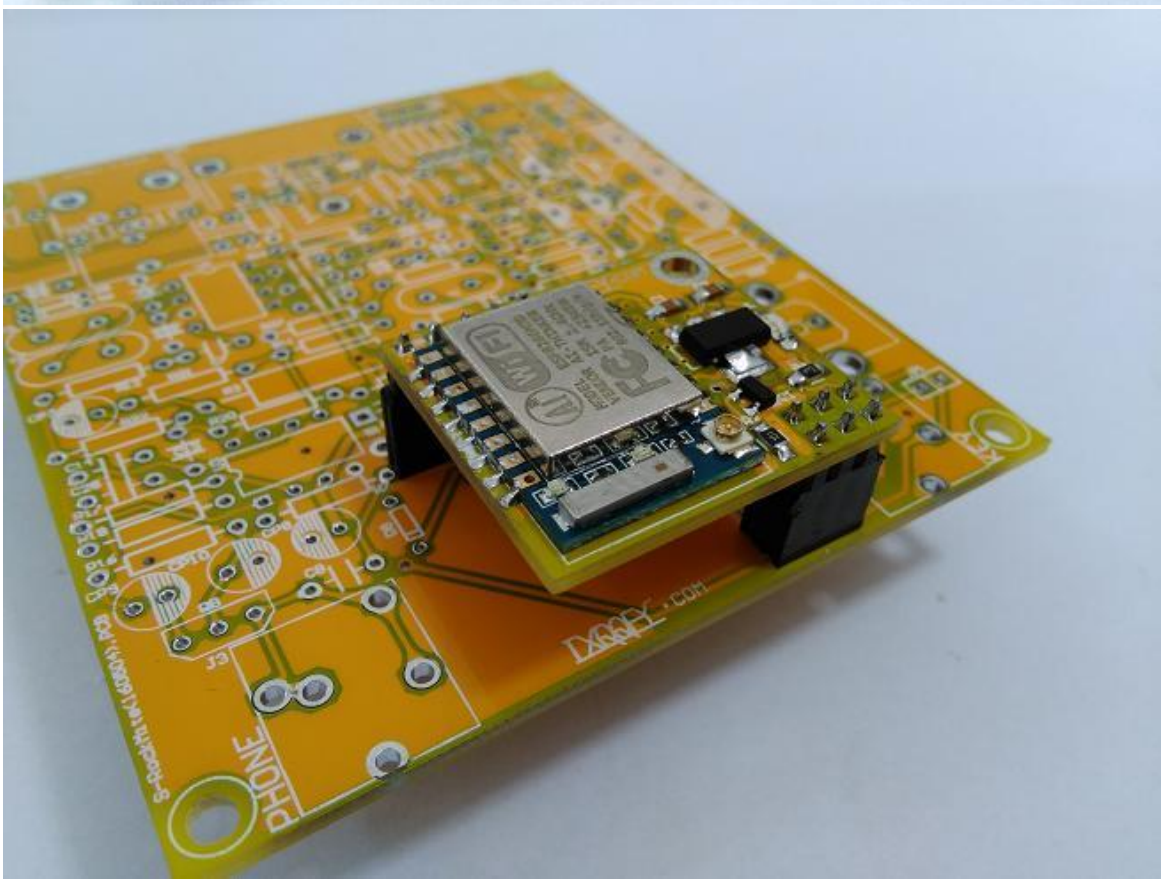
Jumper Cap



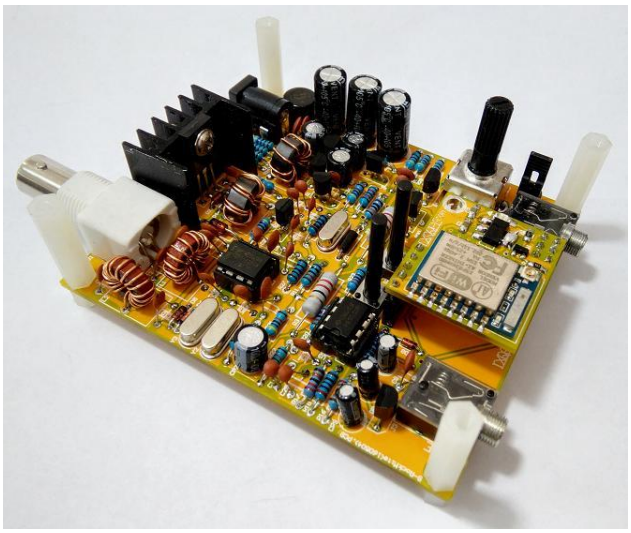
Variable resistor

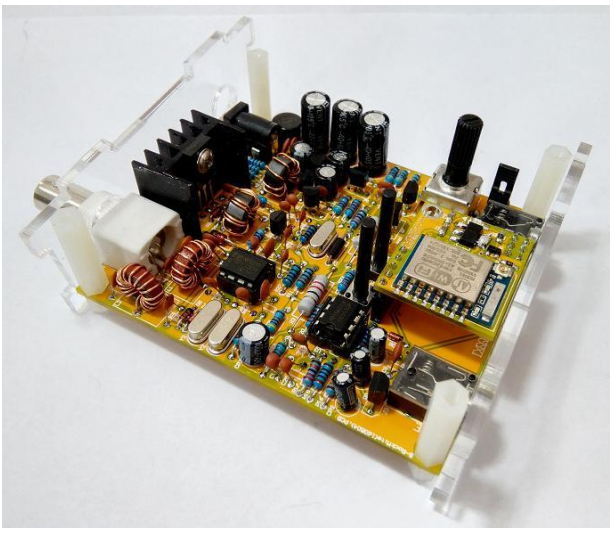
5.14 WIFI Module.

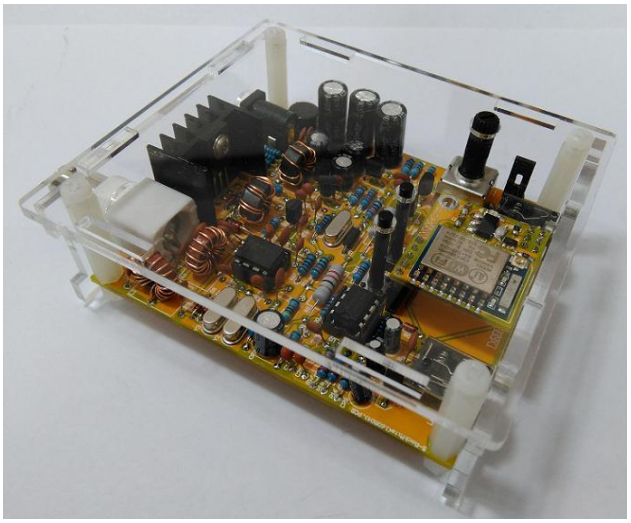


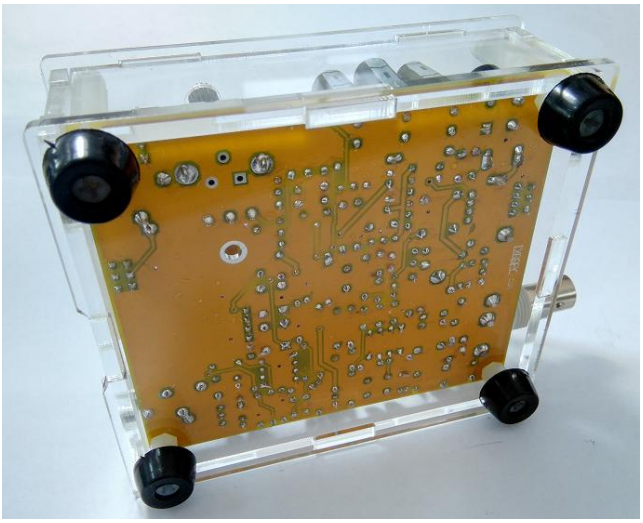


5.15 Install the acrylic case.





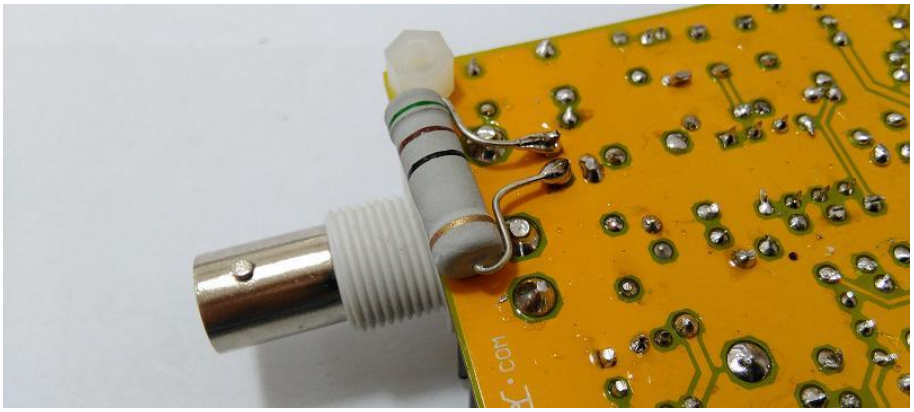




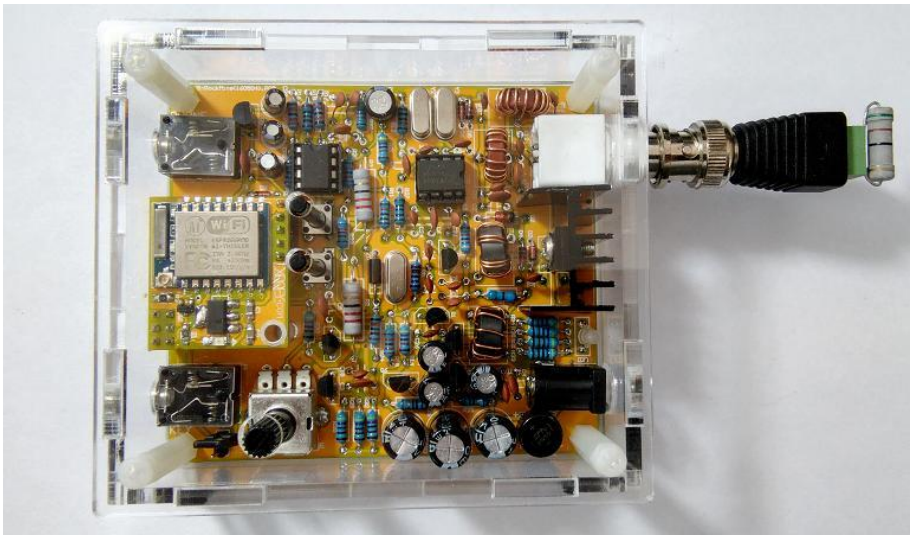
6. Debug

6.1 The power before installation of dummy load.

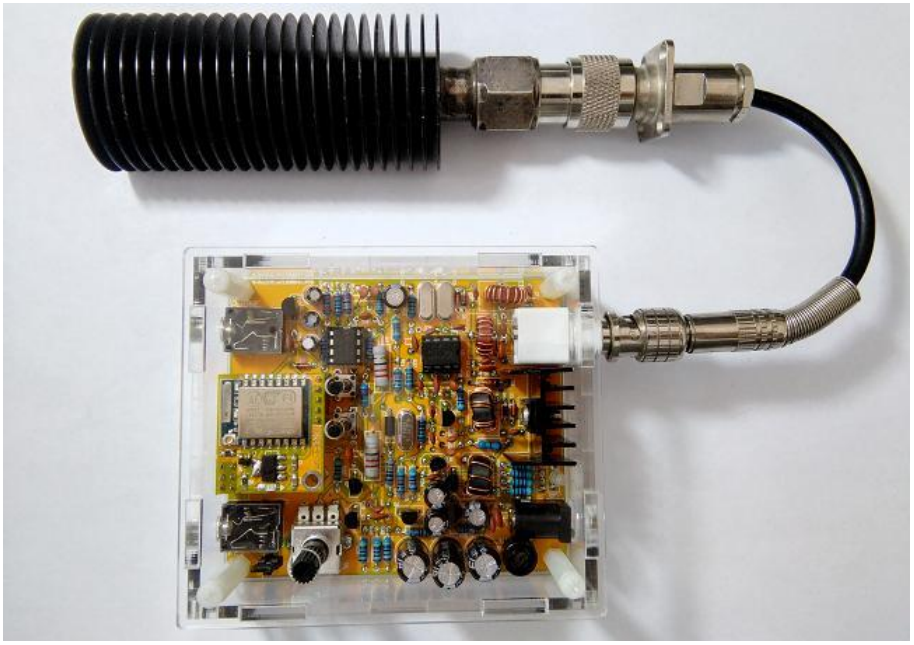
Method 1:



Method 2:



Method 3:



6.2 Power on: Do not distinguish between positive electrode and negative electrode(Internal rectification), Recommend the use of battery, Can also use the DC linear voltage stabilized power supply. If power on after tens of seconds without abnormal heating,then it's normal.

6.3 Listen to the base noise: Connect the 8ohm headset, after power will hear a slight voice, then it's normal.

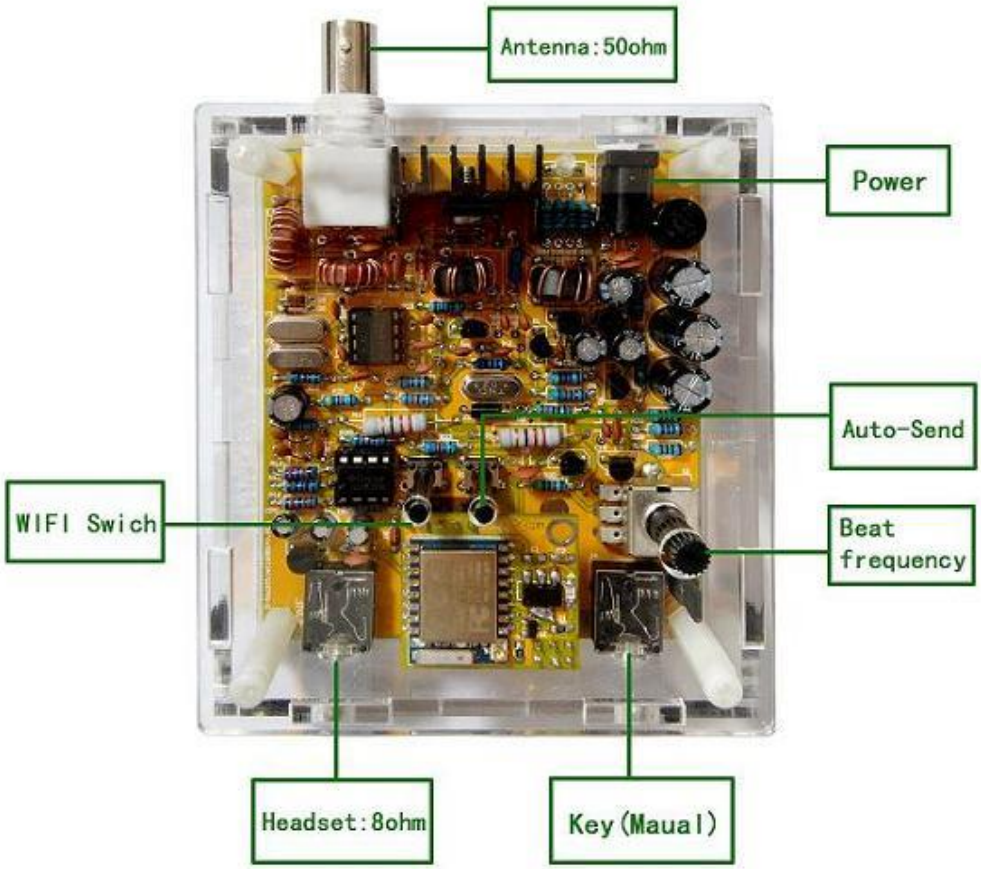
6.4 The receiving circuit test: If connect the antenna to hear the voice and do not connect the antenna to hear the voice of a great difference,then it's normal.

6.5 The sending circuit test: Connect dummy load, don‘t install WIFI module, short circuit JP1, connect the key, and power on. Now you can use the key control to send, Static current:40~100mA,Sending current:400mA, In the sending state under the virtual load will be fever. Note: it is not a long time to send.

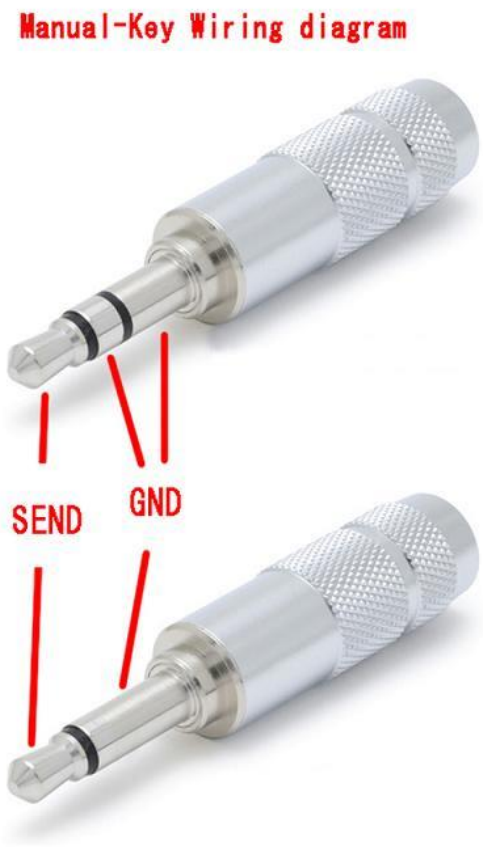
6.6 The WIFI module test: Connect dummy load, install WIFI module, circuit breaker JP1, connect the 8ohm headset, connect the key, and power on. Click "WIFI button" to open a WIFI connection, would you hear "ka ka" sound, then WIFI is opened. Download the APP from the www.lxqqfy, using APP to connect the WiFi module to communicate.

7. Usage method

7.1 Function diagram



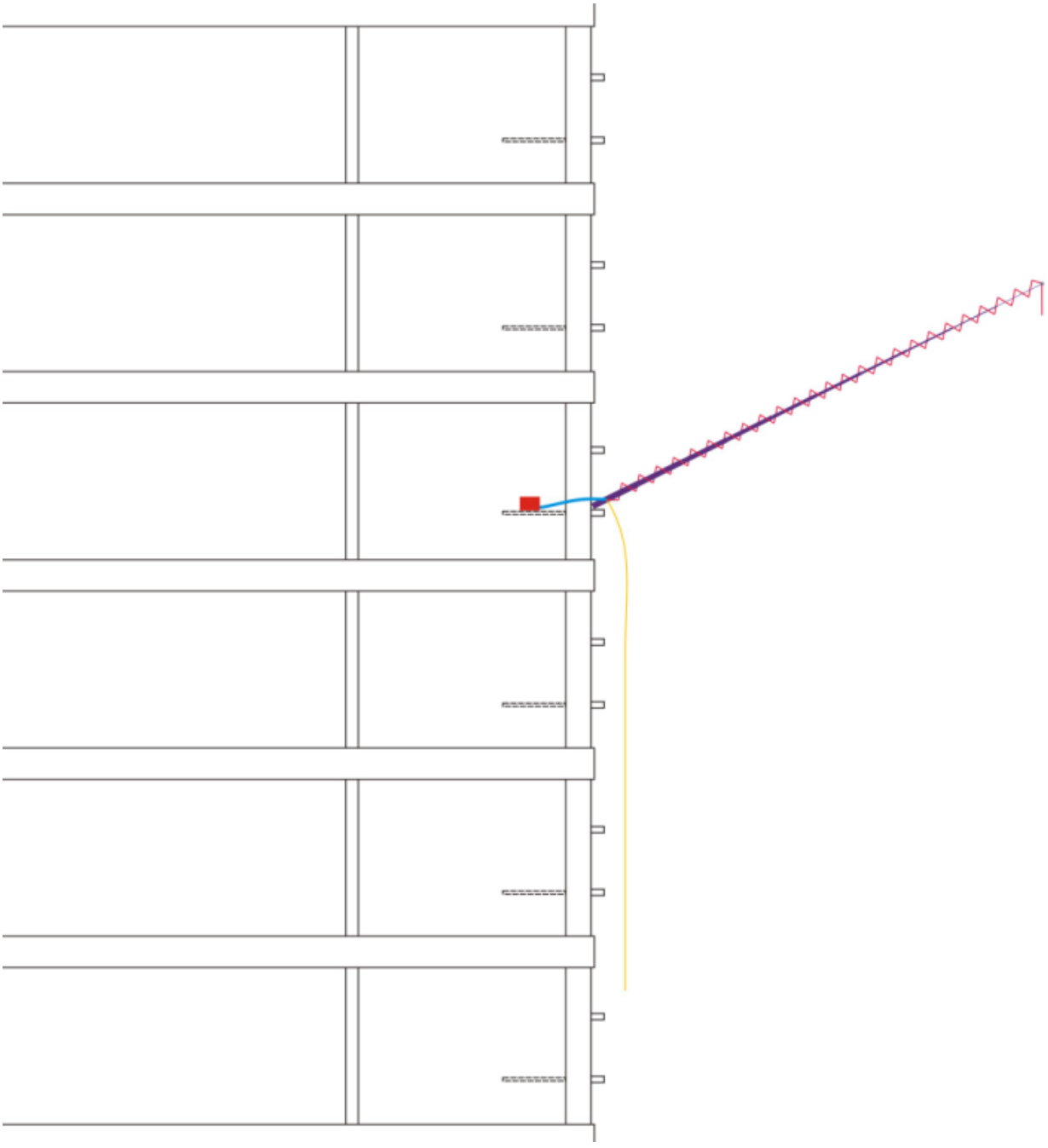
7.2 Key.



7.3 Using the most common 8ohm headset.

7.4 The antenna is the key of the shortwave station, Requirements: frequency 7MHz, impedance 50ohm, SWR <1.5. Recommend the following:

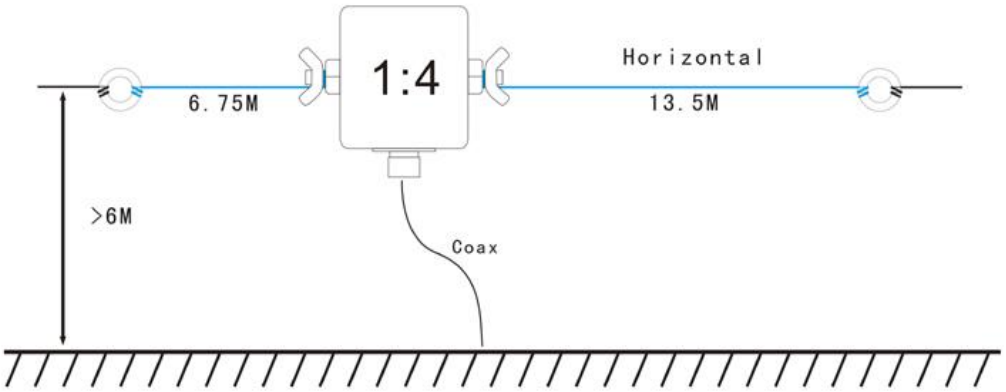
7.3.1 GP Antenna.

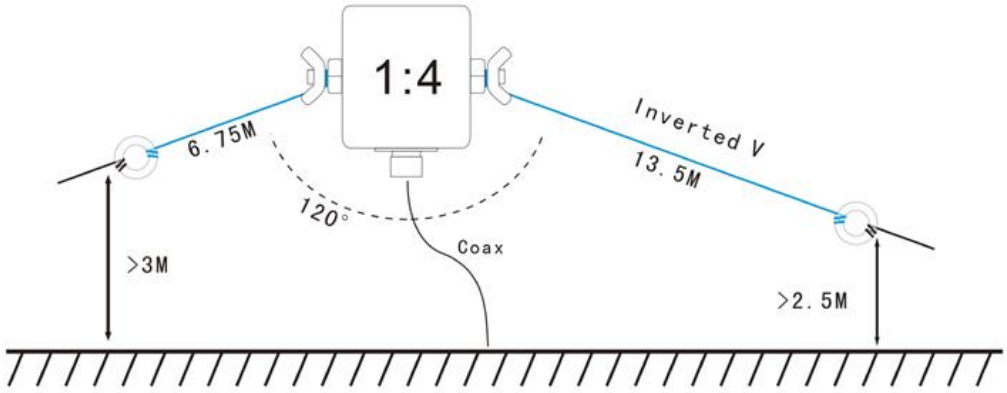


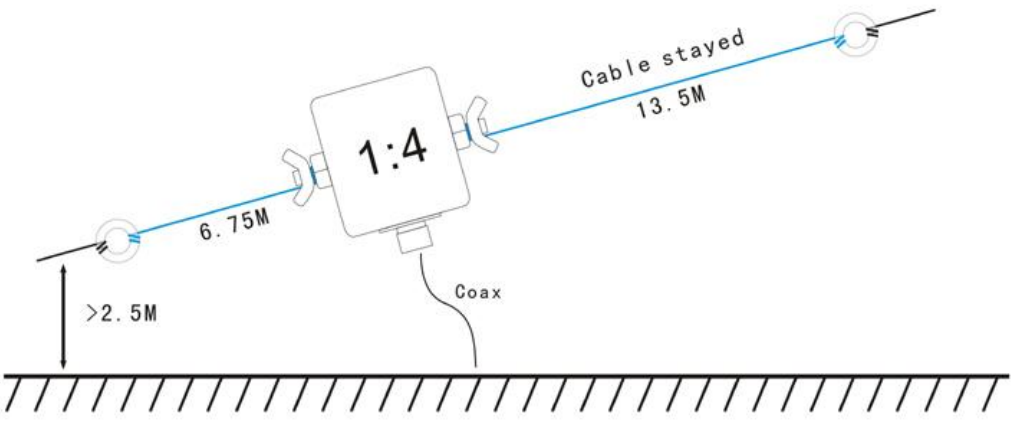
Red: Radio; Bule: Feeder(50ohm); Violet: Fishing rod(9 meters); Yellow: Dummy grounds(9 meters); Pink:: Oscillator(10.1 meters);

7.3.1 Windom Antenna.

Winton antenna can be good to work in the three 40m/20m/10m band, the use of 1:4 Balun, according to the actual environment can have a variety of different installation methods.

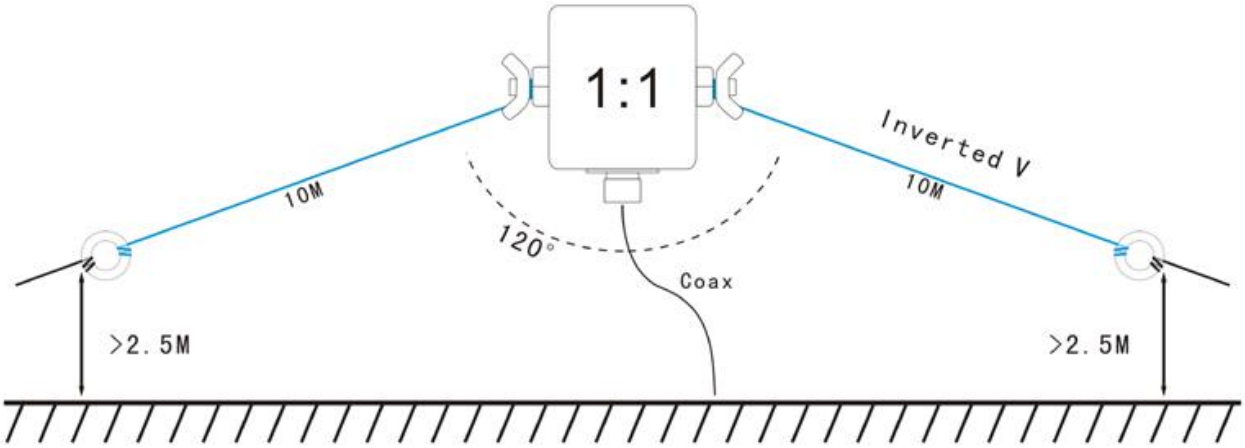






7.3.1 DP Antenna.

The DP antenna is adopted skywave communication,long distance communication effect is very good,the use to 1:1 balun, usually V installation.



7.4 The use of WIFI Module and Mobile phone APP

7.4.1 Download Mobile phone APP from http://www.lxqqfy.com/.

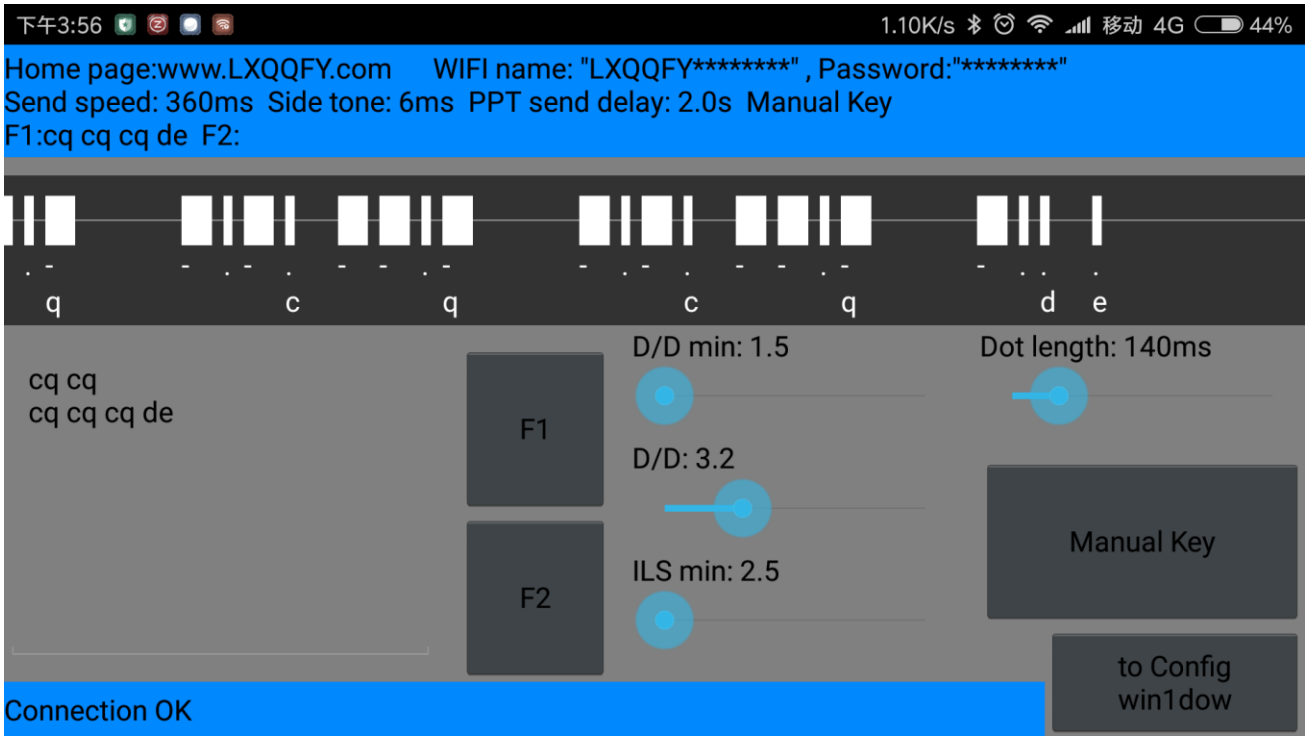
7.4.2 Install WIFI module, circuit breaker JP1,power on.

7.4.3 Click on the "**WIFI switch**" button on the radio to open the radio WIFI hot spot (default WIFI closes)..

7.4.4 Open Mobile phone, connect WIFI,The name is " LXQQFY********",the password is "********","********" is **8 bit random number**.

7.4.5 Open the APP,will be prompted to connect successfully. The status bar at the bottom of the screen will display the current state of the connection.

7.4.6 Run windows.



7.4.6.1 “**D/D min**”, “**D/D**”, “**ILS min**”, “**Dot length**” : All the parameters used to identify;

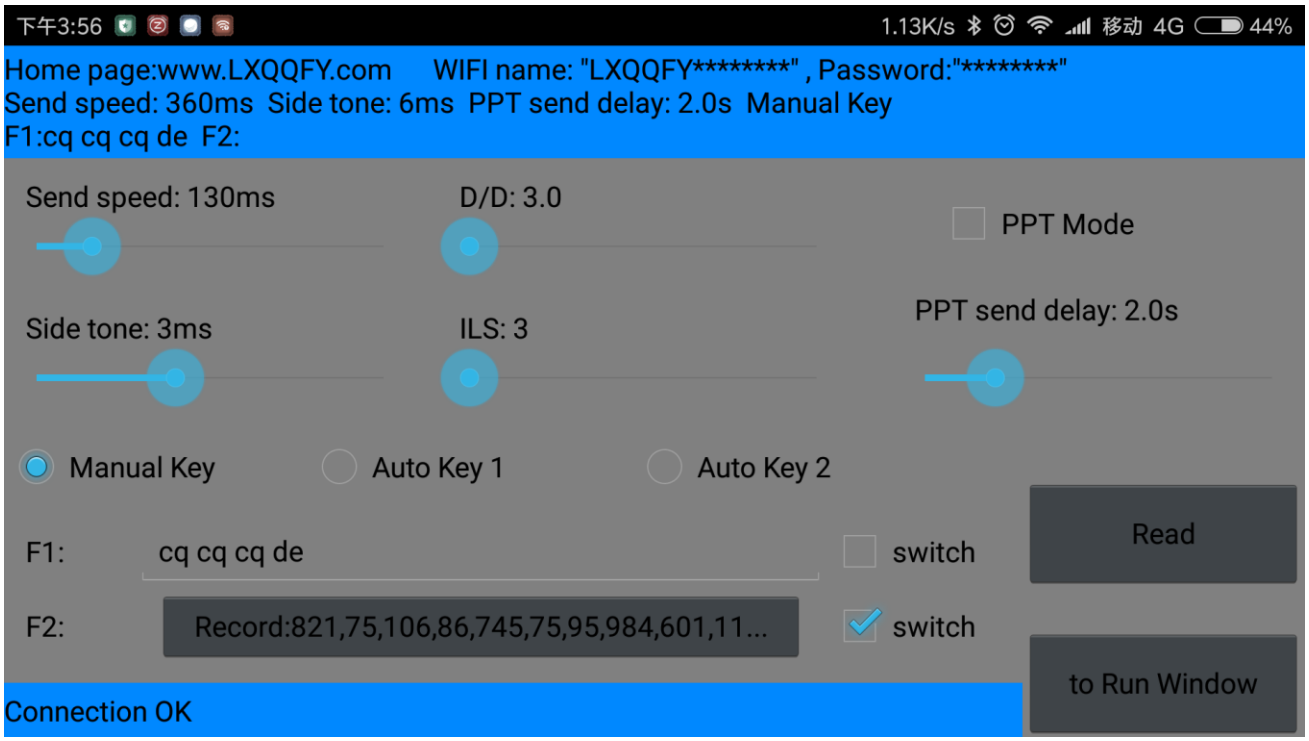
7.4.6.2 “**D/D min**” : The minimum ratio of dot length and dash length;

7.4.6.3 “**D/D**” : The standard ratio of dot length and dash length;

7.4.6.4 “**ILS min**” : Minimum length of word interval;

7.4.6.5 “**Dot length**” : The length of dot;

7.4.7 Config Window.



7.4.7.1 "**Send speed**", "**D/D**", "**Side tone**", "**ILS**": All parameters used for automatic transmitter.

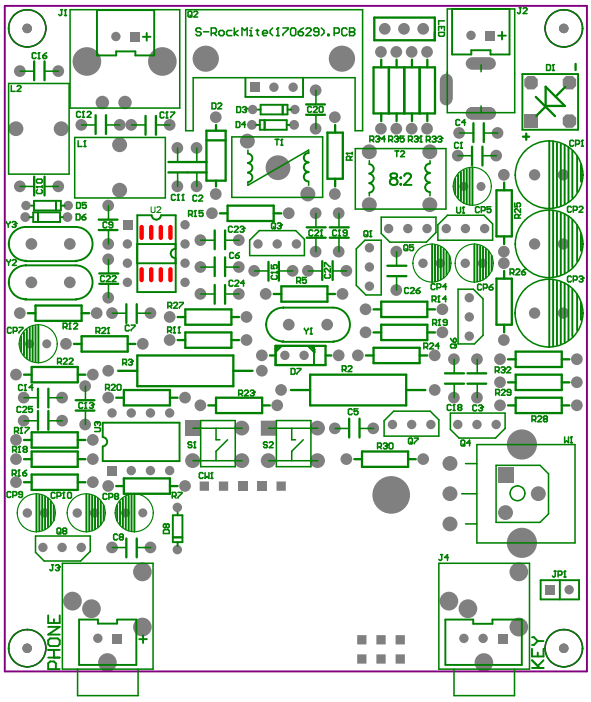
7.4.7.2 "**PPT Mode**", "**PPT send delay**": This parameter is useless in this state, do not choose.

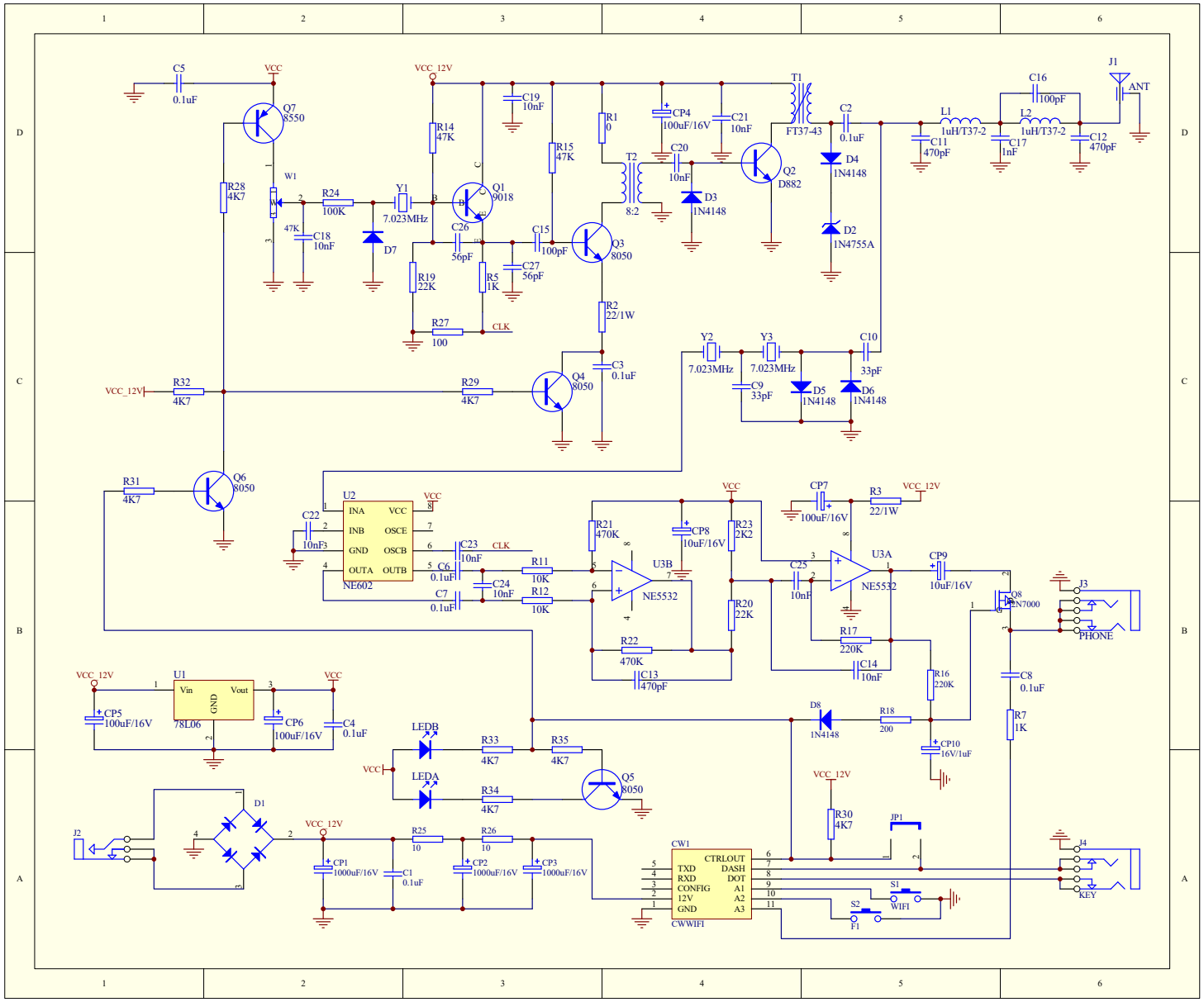
7.4.7.3 "**Manual Key**", "**Auto Key 1**", "**Auto Key 2**": Key work mode;

7.4.7.4 "**F1**", "**F2**": Automatic transmitter, "**switch**" used for conversion record mode;

8 List of components

1/4W Resistor		**Capacitor**	
R1	0 ohm	C1 C2 C3 C4 C5 C6 C7 C8	0.1uF(104)
R25 R26	10 ohm	C18 C19 C20 C21 C22 C23 C24 C25	10nF(103)
R2 R3	22ohm/1 W	C17	1nF(102)
R27	100 ohm	C15 C16	100pF(101)
R18	200 ohm	C9 C10	33pF(33)
R5 R7	1K	C27 C26	56pF (56)
R23	2K2	C13 C11 C14 C12	470pF(471)
R11 R12	10K	**Electrolytic capacitor**	
R29 R30 R32 R31 R33 R34 R35 R28	4K7	CP1 CP2 CP3	1000uF/16V
R19 R20	22K	CP4 CP5 CP6 CP7	100uF/25V
R14 R15	47K	CP8 CP9	10uF/16V
R24	100K	CP10	1uF/16V
R16 R17	220K	**Inductance**	
R21 R22	470K	T1	1:4 transformer (FT37-43 6)
Transistor		T2	Transformer(FT37-43 8:2)
D1	2W10(Bridge rectifier)	L1 L2	1uH(T37-2 16)
D2	1N4755A(Diode)	**IC**	
D7	1N4001 or Variode	U1	78L06
D3 D4 D5 D6 D8	1N4148(Diode)	U2	NE602
Q8	2N7000(FET)	U3	NE5532
Q1	9018(Triode)	**Crystal oscillator**	
Q2	D882(Triode)	Y1 Y2 Y3	7.023MHz
Q3 Q4 Q5 Q6	8050(Triode)	**Variable resistor**	
Q7	8550(Triode)	W1	47K(473)
LED	Two color LED	**Other**	
PCB * 1		JP1	Pin and Jumper Cap
0.5mm Enameled wire		J1	Q9(BNC)
The heat sink and screw (for D882)		J2	DC Jack
51ohm 2W Resistor(for dummy load)		J3 J4	3.5mm Socket(Key and Phone)
Acrylic case		S1 S2	Key
SIP5 DIP6(for WIFI Module)		**WIFI Module(Optional)**	


S-RockMite(170629).PCB
8:2
PHONE
KEY


C5
0.1uF
VCC
Q7
8550
W1
R28
4K7
R24
100K
47K
C18
10nF
Y1
7.023MHz
D7
VCC_12V
R14
47K
Q1
9018
C26
56pF
R19
22K
R5
1K
C27
56pF
C19
10nF
C15
100pF
R15
47K
Q3
8050
R1
0
T2
8:2
CP4
100uF/16V
C20
10nF
C21
10nF
D3
1N4148
T1
FT37-43
Q2
D882
C2
0.1uF
D4
1N4148
D2
1N4755A
L1
1uH/T37-2
C11
470pF
L2
1uH/T37-2
C17
1nF
C16
100pF
C12
470pF
J1
ANT
R27
100
CLK
R2
22/1W
C3
0.1uF
Q4
8050
R32
4K7
R29
4K7
Y2
7.023MHz
Y3
7.023MHz
C9
33pF
D5
1N4148
C10
33pF
D6
1N4148
R31
4K7
Q6
8050
U2
INA
INB
GND
OUTA
VCC
OSCE
OSCB
OUTB
NE602
C22
10nF
C23
10nF
C6
0.1uF
C24
10nF
C7
0.1uF
R11
10K
R12
10K
R21
470K
U3B
NE5532
CP8
10uF/16V
R23
2K2
R20
22K
R22
470K
C13
470pF
CP7
100uF/16V
R3
22/1W
U3A
NE5532
C25
10nF
CP9
10uF/16V
R17
220K
C14
10nF
R16
220K
Q8
PEN7000
J3
PHONE
C8
0.1uF
R7
1K
U1
Vin
GND
Vout
78L06
CP5
100uF/16V
CP6
100uF/16V
C4
0.1uF
LEDB
LEDA
R33
4K7
R34
4K7
R35
4K7
Q5
8050
D8
1N4148
R18
200
CP10
16V/1uF
R30
4K7
JP1
J2
D1
R25
10
R26
10
CP1
1000uF/16V
C1
0.1uF
CP2
1000uF/16V
CP3
1000uF/16V
CW1
CTRLOUT
TXD
RXD
CONFIG
12V
GND
DASH
DOT
A1
A2
A3
CWWIFI
S1
WIFI
S2
F1
J4
KEY